

2000

Confluence



▲ **Chinese wisteria (*Wisteria sinensis*)**, an invasive exotic vine, grows along the George Washington Memorial Parkway, overwhelming trees and other native vegetation. The fast-growing and highly competitive species will be the target of future invasive plant control measures by the National Capital Region Exotic Plant Management Team. *Rosa Wilson*

The challenge that lies ahead will be to learn how to preserve parks for future generations. In a changing world, what will keep these parks natural and healthy?

—Excerpt from the Natural Resource Challenge:
the National Park Service's action plan for preserving natural resources

In 1999 the National Park Service articulated its commitment to natural resource preservation in the Natural Resource Challenge. This five-year national program identifies numerous actions needed to sustain park natural resources in the 21st century and has resulted in two substantial budget increases for natural resource programs: \$14.3 million in FY 2000 and \$15.3 million in FY 2001. Through the strategies outlined in the Challenge and with the increased funding provided by Congress, the National Park Service is stepping up to a new level of resource management and applying the best science to high-priority natural resource management issues affecting parks. As events in 2000 indicate, the Park Service is increasing its capabilities to control invasive vegetation, to maximize scientific collaboration and education opportunities with partners, and to expand and speed up natural resource inventories, among other efforts. This effective program continues to build momentum and rally enthusiasm and support for worthy conservation goals. Through the Challenge the National Park Service is moving forward in protecting the country's natural heritage for the American people.

Invasive Vegetation

Natural Resource Challenge funds Exotic Plant Management Teams

By Linda Drees and Gary Johnston

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After habitat loss, invasive or exotic species are considered the greatest threat to the preservation of natural resources throughout the national park system. They are implicated in the listing of 42 percent of all species protected by the Endangered Species Act. Additionally, more than 2 million acres of national parklands are infested by exotic invasive plant species.

A new weapon to combat exotic plant species was launched by the National Park Service in 2000. Called the Exotic Plant Management Team or EPMT, the new capability was modeled after the coordinated rapid response approach used in wildland fire fighting because it is also effective in controlling exotic plants. The first test of the EPMT concept was made in 1997 at Lake Mead National Recreation Area (Nevada and Arizona) and served park units throughout the Southwest. Its success led to a request to fund the establishment of four EPMTs through the Natural Resource Challenge (the Challenge). As a result, four teams were established in FY 2000 with approximately \$1.2 million in Challenge funding: (1) Florida EPMT (based at International University in Miami); (2) National Capital Region EPMT (based at Rock Creek Park, Washington, D.C.); (3) Chihuahuan Desert/Southern Shortgrass Prairie EPMT (based at Carlsbad Caverns National Park, New Mexico); and (4) Pacific Islands EPMT (based at Haleakala National Park, Hawaii). Each will serve parks over a broad geographic area.

*"[EPMTs are]
a new weapon to combat
exotic plant species."*

The success of the EPMT derives from its ability to adapt to local conditions and needs. Each team employs the expertise of local experts and the capabilities of local agencies. Each sets its own work priorities based on the following factors: severity of threat to high-quality natural areas and rare species; extent of targeted infestation; probability of successful control and potential for restoration; opportunities for public involvement; and park commitment to follow-up monitoring and treatment. Thus, each EPMT provides a highly trained, mobile *strike force* of invasive plant management specialists to assist parks with limited resources and expertise in the control of exotic plants.

The EPMTs of Florida and the National Capital Region provide excellent yet contrasting illustrations of regional adaptability. The Florida EPMT formed a partnership with the Upland Invasive Plant Management Program of the Florida Department of Environmental Protection and approximately 136 other groups in the program to control invasive plants. Furthermore, it augments existing exotic plant control efforts in Big

Cypress National Preserve and Everglades National Park. With one-to-one matching funds provided by the State of Florida, the partners pay for removal of exotics in 11 units of the national park system in Florida. The EPMT of the National Capital Region takes another approach. This team serves 10 regional parks directly by assisting in the control of exotic plants. It also trains park personnel to manage infestations within the limited fiscal resources available to the park.



▲ **Workers with the National Capital Region EPMT** employ a chainsaw in the removal of Chinese wisteria at Prince William Forest Park, Virginia. The EPMTs are part of a strategy for long-term control of invasive plants set by the Natural Resource Challenge. Actions by the teams also address the Government Performance and Results Act goal 1a1B: containing exotic plant disturbances. Furthermore, these actions meet the requirements of Executive Order 13112 on invasive species, which includes provisions of the Invasive Species Council National Management Plan.

The teams and the NPS Biological Resource Management Division are developing a database for the monitoring evaluation of EPMT effectiveness. The system will also track information about each project such as work site, date, species removed, management technique, number of person-hours, and extent of eradicated plants.

In less than a year, the four EPMTs have been staffed, equipped, and readied for on-the-ground management of invasive plant species. Ultimately, 10 teams are planned to be deployed full-time throughout the national park system to reduce the impacts of invasive plants on natural and cultural resources.

NPS

Inventory and Monitoring Program benefits from the Natural Resource Challenge

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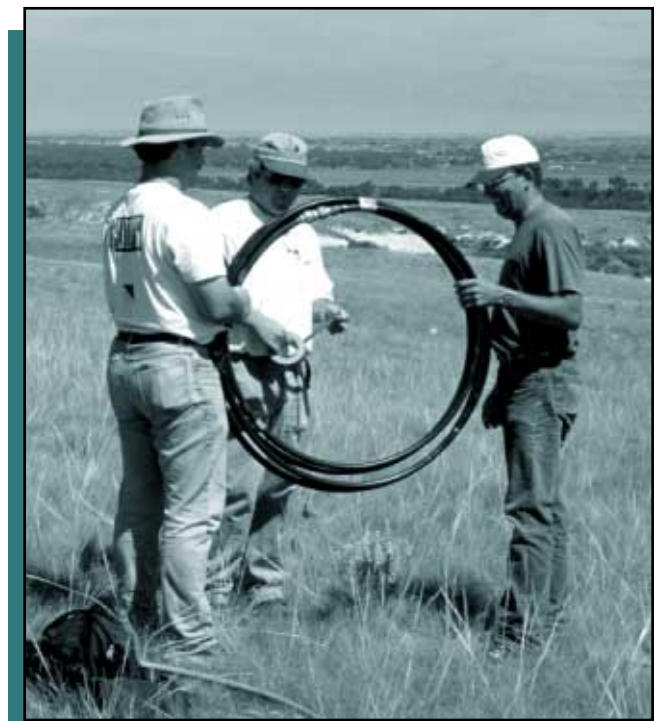
In FY 2000 the NPS Inventory and Monitoring (I&M) Program received a base increase of \$7.3 million for accelerating 11 of the 12 basic inventories initiated by the program in 1992. In particular, the increase is for vertebrate and vascular plant inventories, which had received little funding since the program began. The funding will allow the National Park Service to complete all of the basic resource inventories in about seven to eight years.

Most of the nonbiological inventories have been conducted by staff of the I&M Program; the biological inventories, on the other hand, will be managed primarily by NPS regional and park personnel. The inventories will be conducted in collaboration with local universities and state and federal agencies to establish partnerships and agreements to share costs and avoid duplication of effort. For that reason, a small portion of the increased funding was given to the regional offices to hire inventory coordinators to carry out those functions. The Park Service also designed and adopted a national strategy for organizing the biological inventories and implementing the park vital signs monitoring called for in the Natural Resource Challenge. Under this strategy, all of the units in the national park system that have significant natural resources ("natural resource parks") have been assigned to one of 32 separate networks of parks that share similar ecological characteristics. The regional I&M coordinators worked with the networks in FY 2000 to develop inventories and to begin implementing them.

Five million dollars of the FY 2000 increase was allocated to vertebrate and vascular plant inventories, including approximately \$1 million for special inventories of amphibian populations in 12 parks. These particular parks will be incorporated into a larger amphibian research and monitoring effort of the U.S. Geological Survey. The amphibian inventories acquired much of the baseline information needed to support future research in these parks and also yield information that park managers can use to address a variety of resource management and protection issues. For example, preliminary research at Sequoia and Kings Canyon National Parks has suggested that introductions of sport fish into previously fishless lakes may have led to the extirpation of amphibians in some of those areas.

Inventories of park, local, regional, and university museums and herbaria were undertaken to acquire and verify as much information as possible on species occurrence in the parks. More than 239,000 species records for parks were verified, obtained, and incorporated into a new national database that includes information on more than 68,000 voucher specimens (i.e., those that document the occurrence of a species in a particular park). This represents the first time that the National Park Service has so comprehensively verified a database on park vertebrates and vascular plants. In addition to compiling and verifying existing species information, another focus of the vertebrate and vascular plant inventory has been to fund the most acute resource inventory needs in parks that are most capable of implementing new,

integrated inventory methods. One recipient of such funding was the Pacific Island Network. Nesting Tahiti petrels were discovered on the summit of Mt. Lata, on Ta'u in the National Park of American Samoa. This seabird was not previously known to breed in American Samoa. The inventories also documented the recent arrival of an introduced finch and several plant species in Hawaii Volcanoes National Park. Early identification is important for rapid control of exotic species.



▲ Staff prepare to use plastic hoops for sampling prairie vegetation in permanent plots in Scotts Bluff National Monument, Nebraska. Long-term ecological monitoring reveals changes in the structure and species composition of plants. Such information is indispensable for evaluating grassland communities and for determining the effectiveness of restorative measures such as prescribed fire, seeding, plantings, and control of exotic plants.
Lisa Thomas, Great Plains Prairie Cluster

The FY 2000 funding also sped up nonbiological inventories. For example, more than 6,000 base maps and related data products were acquired for 230 parks, increasing to 248 (96 percent) the number of parks for which this inventory has been completed. Additionally, data on several air quality parameters were assembled from existing national data sets for use in statistically estimating air quality in parks that do not have air quality-monitoring stations. This approach is cheaper than measuring air quality in each park and will provide for the first time comprehensive air quality information for all natural resource parks. These baseline data will be critical in determining where future monitoring is needed to measure changes in park air quality, both locally and regionally, throughout the national park system.

Maximizing Scientific Collaboration

CESUs and the inventory and monitoring networks: A case of good timing

By Kathy Tonnessen, Ron Hiebert, and Larry Norris

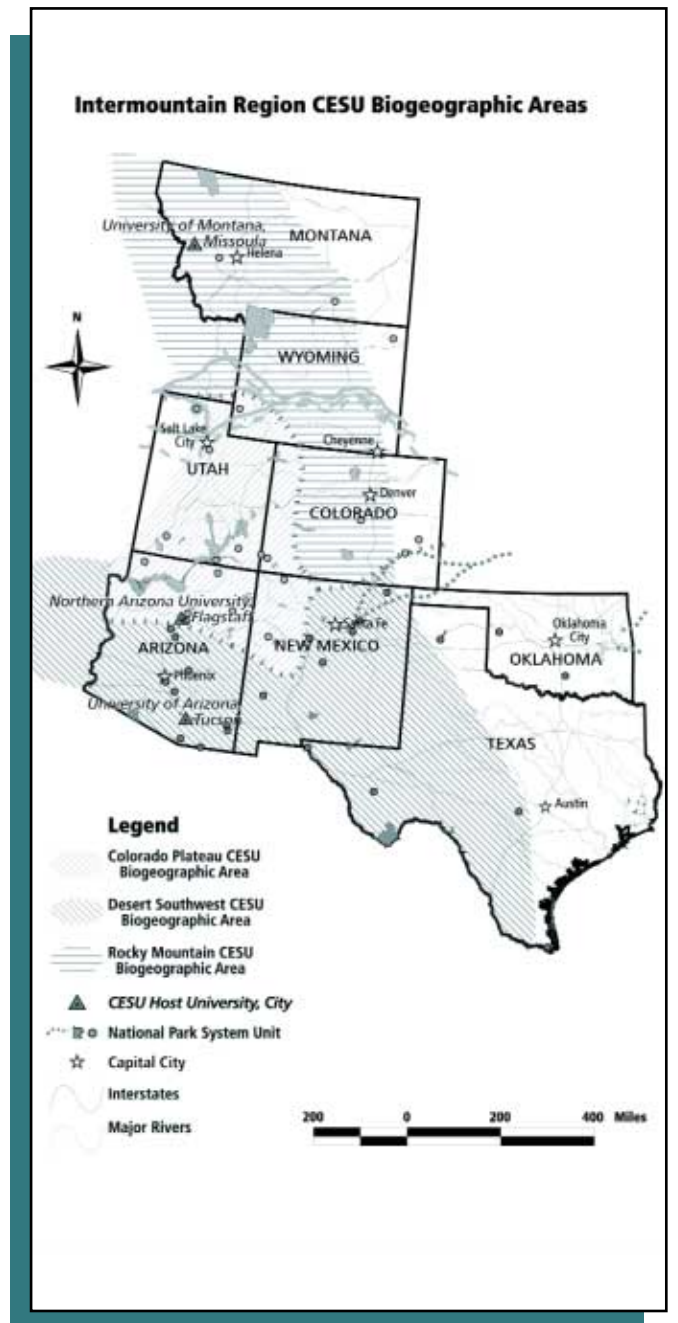
In 2000 three research coordinators with the NPS Intermountain Support office moved to their posts at host universities of three cooperative ecosystem studies units (CESUs): Kathy Tonnessen at the University of Montana, Missoula (Rocky Mountains CESU); Ron Hiebert at Northern Arizona University, Flagstaff (Colorado Plateau CESU); and Larry Norris at the University of Arizona, Tucson (Desert Southwest CESU). These moves coincided with a flurry of activity in the inventory and monitoring (I&M) networks and included the hiring of network coordinators, the holding of expert workshops, and the writing of inventory proposals for funding in FY 2001.

Established in 1999, the I&M networks were created to implement inventory and monitoring across the national park system. Their role is to track the most critical ecological variables or indicators of ecosystem health in the parks, commonly called “park vital signs.” In 2000, the I&M networks began planning for the inventory of vascular plants and vertebrates, the first major initiative of the Natural Resource Challenge. A number of options were available to get the scientific expertise and leadership needed for this biological inventory planning, and within the Intermountain Region several networks called upon the CESU research coordinators, CESU partner universities, and the cooperating CESU agencies for assistance.

“Science coordination in the National Park Service was available through the CESU network....”

Within the Rocky Mountains CESU, Kathy Tonnessen served as the chair of the Greater Yellowstone Network in organizing the inventory. She worked with a technical committee with representatives from several member parks to organize the workshop, write the biotic inventory proposal, and hire an inventory coordinator. In 2000 the network also began the planning phase of park vital signs monitoring, and Kathy will serve on the board of directors for that long-term monitoring project. Kathy also assisted the Rocky Mountain Network in organizing their expert workshop and writing the inventory proposal. She will be part of the network steering committee in charge of carrying out the recommended inventory projects. More importantly the Rocky Mountains CESU partner universities and agencies (such as the USDA Forest Service and USGS) were active players in outlining the

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▲ **Organized around biogeographic areas**, the three cooperative ecosystem studies units in the NPS Intermountain Region provide research, technical assistance, and education services to parks. In 2000, several NPS inventory and monitoring networks requested CESU assistance in planning for the inventory of vascular plants and vertebrates. NPS Intermountain GIS Office and Natural Information Division, Denver, Colorado; January 2001

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inventory needs and providing the scientific content for these two proposals. Both networks are making use of CESU member scientists from academia and agencies as both principal investigators and science advisers to this effort.

"Coincidence brought the CESUs into operation at the same time as the funding for inventory and monitoring networks...."

Ron Hiebert of the Colorado Plateau CESU served as the lead for the Southern Colorado Plateau Network and as liaison between it and the Northern Colorado Plateau Network (NCP) to ensure consistency in applying inventory techniques and compatibility of data. He worked with the two network steering committees to organize a joint expert workshop and to form partnerships with taxonomic experts from the USGS Colorado Plateau Field Station and other CESU partner institutions. Coordinators for both networks were hired and joined the team in 2000 to prepare the two top-rated biotic inventory proposals. Ron will continue his role as liaison between these two networks and will work closely with the NCP as it begins its park vital signs monitoring program and initiates a five-park monitoring prototype.

Desert Southwest CESU Research Coordinator Larry Norris has responsibilities for a vast area of ecosystems and is involved with five I&M network plans. He was the lead author on the Southern Plains Network study plan proposal

and he also provided information and advice to the Chihuahuan Desert Network on inventory priorities and on the use of cooperative agreements, interagency agreements, and contracts. Larry has agreed to be an ex-officio member on the board of directors for the Sonoran Desert Network, and he is ready to assist as a technical adviser to the Mojave Desert and Gulf Coast Networks. Throughout the Southwest Cluster, Larry is looking for research projects that complement the I&M inventories by creating knowledge for use by management and by sharing resources and equipment.

Coincidence brought the CESUs into operation at the same time as the funding for inventory and monitoring networks under the Natural Resource Challenge. The timing was fortuitous in that science coordination in the National Park Service was available through the CESU network to assist parks with their natural resource inventory needs. The CESUs are likely to provide more service and scientific expertise as the I&M networks begin their work on the complicated task of defining their park vital signs that will be tracked over the long term.



Four new cooperative ecosystem studies units established



The Natural Resource Challenge allocated \$1.6 million in FY 2001 to establish four new cooperative ecosystem studies units (CESUs). The new units cover the Pacific Northwest (including Southeast Alaska), Desert Southwest, Great Plains, and South Florida/Caribbean. They join four CESUs that were established in 1999, covering the Colorado Plateau, Rocky Mountains, Southern Appalachian Mountains, and North Atlantic Coast. CESUs provide research, technical assistance, and education to national parks and other federal land management, environmental, and research agencies and their partners. They also provide support in biological, physical, social, and cultural sciences needed to address resource issues in an ecosystem context. Thirty-eight universities and other institutions are involved in the four new CESUs. Nine federal agencies and 61 host and partner institutions are currently included in the CESU network.

Coral reefs at Dry Tortugas National Park, Florida, are among the many regional park resources that will benefit in the coming years from the research, technical assistance, and education services available through the South Florida/Caribbean CESU, established in 2000. *NPS Submerged Resources Center*



Natural resource project funding increased



The Natural Resource Challenge FY 2000 budget provided a big boost to critical park resource management programs. One of the programs that benefited was the Natural Resource Preservation Program (NRPP), an important funding source for park resource management projects administered under the Disturbed Lands and Threatened and Endangered Species Programs. NRPP funds are allocated to regions for park projects based on a priority ranking process. Of the \$2.875 million increase allocated to NRPP in FY 2000, nearly \$1 million was provided for additional park preservation projects, another \$1 million for disturbed lands restoration projects, and about \$500,000 each for small park projects and threatened and endangered species projects.

◀ **The Ute ladies'-tresses orchid** occurs along the Green River in Dinosaur National Monument (Colorado and Utah). This federally threatened plant species is the subject of ecological studies, funded through NRPP during 2000, that will aid resource managers in evaluating potential effects of future water releases from the Flaming Gorge Dam.



The Challenge funds native and exotic species management



In FY 2000 the Challenge dedicated \$3.449 million to establishing and operating the Biological Resource Management Division. The division—a new part of the Natural Resource Program Center—is responsible for policy formulation, planning, training, coordination, and implementation of biological resource management activities and programs of broad national importance. It focuses on nonnative species management and ecosystem restoration, threatened and endangered species, and wildlife management. In addition to funding the four EPMTs, the Natural Resource Challenge funds were spent in support of the Department of Interior's Invasive Species Council, to obtain technical assistance from CESUs, and to implement exotic plant management projects in parks. The division now includes a division chief, a liaison with the Washington, D.C. staff, a chief of the Exotic Species and Restoration Branch, two integrated pest management coordinators, two endangered species specialists, an ecosystem restoration specialist, a wildlife biologist who assists parks in capturing and moving large animals, and a wildlife veterinarian who addresses wildlife diseases in parks. These biologists are augmenting the Park Service's efforts to preserve, protect, and manage biological resources and related ecosystem processes in the national park system.

▶ **A nonnative African oryx (gemsbok)** is readied for helicopter removal from White Sands National Monument to neighboring White Sands Missile Range, New Mexico. The new NPS Biological Resource Management Division provided a wildlife capture specialist and a veterinarian, on staff, and through a new task agreement with the Colorado State University College of Veterinary Medicine, a veterinary resident (shown here), and a veterinary medicine technician. Eighty-two oryx were removed from the monument in 2000 using nonlethal methods.



Connecting the public, scientists, and resources through learning centers

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Imagine a network of cooperating scientists and educators, NPS staff, and park facilities that are combined to preserve and protect vast areas of national significance. From the information generated through this collaboration superintendents are able to make critical resource decisions based on scientific knowledge and ecological principles. Public support coalesces around these management decisions because they are defensible and preserve ecological integrity. Finally, the network consists of individual centers of activity throughout the country and nurtures the next generation of scientists and educators who will guide future management of our planet through the 21st century. This vision progressed toward reality in 2000 when the National Park Service created the first learning centers in the national park system.

To help realize this future, the Natural Resource Challenge includes a commitment to establishing 32 learning centers around the country. Strategically placed in inventory and monitoring networks and unified in concept and function, they will facilitate park research and educate the American public about the health of park resources and the regions they live in.

After a national competition in 2000, five pilot centers were selected and subsequently funded as part of the FY 2001 appropriation for the Natural Resource Challenge. These centers are currently being developed at parks across the country that are located in different inventory and monitoring networks. The five centers are the Pacific Coast Learning Center at Point Reyes National Seashore (California), the Atlantic Learning Center at Cape Cod National Seashore (Massachusetts), the McGraw

Ranch Learning Center at Rocky Mountain National Park (Colorado), the Rim of Fire Marine Science Center at Kenai Fjords National Park (Alaska), and the Purchase Knob Learning Center at Great Smoky Mountains National Park (Tennessee and North Carolina). Another eight centers have been selected for possible funding in FY 2002; by 2005 the hope is for a nationwide system of 32 learning centers to be formed.

Conceived as public-private partnerships, learning centers will support research activities, the accumulation and synthesis of information, and the direct transmission of information to the public. Each center will provide computer access and laboratory, office, and dormitory facilities. They will only have a small core staff, paid for by appropriation, and will rely heavily on partnerships for both start-up and operational expenses.

Equally important, the centers will promote education and outreach through an education specialist who will work with area park interpreters and partners. Building upon and expanding the National Park Service's environmental education effort, the centers will help transfer information learned about park resources to park visitors and the broader public through diverse educational programs. The centers will help to carry a nationwide message to the public about the health of the national park system and the importance of parks as biological reserves. Although developed as a part of the Natural Resource Challenge, the centers are not meant to focus on natural resources only, but on opportunities for parks to become laboratories, libraries for research, and learning centers for and about *all* park resources. Imagine the potential.



◀ A former U.S. Air Force station in Truro, Massachusetts, now the Highlands Center for the Arts and the Environment, is the site of the Atlantic Learning Center within Cape Cod National Seashore. The Air Force transferred the locale to the seashore in 1994; the National Park Service and several partners are currently adapting the facilities for use as the first learning center to serve the Northeast.

Geologic Resources Division expands expertise



Resource managers across the national park system have identified the critical need for geologic expertise to protect park features and manage resources such as fossils, caves, and shorelines. Park staffs also recognize that effective restoration requires an understanding of the natural geologic setting. In recognition of this need, the FY 2000 budget for the Natural Resource Challenge devoted an additional \$696,000 to expand the professional staff of the Geologic Resources Division. The division used these funds to hire specialists in cave and geologic inventories, coastal geology, paleontology, and restoration geomorphology, in addition to a director for the National Cave and Karst Research Institute. These geoscientists will assist in implementing resource protection projects in the 200-plus parks with significant geologic resources.

◀ **White Bird Battlefield**, where the Nez Perce defeated the U.S. Army in 1877, is altered by a modern, abandoned sand and gravel mine (top). In 2000, newly hired restoration geomorphologists with the Geologic Resources Division assisted staff of Nez Perce National Historical Park, Idaho, in restoring the site (bottom).



Award-Winner Profile

Gary Machlis receives Conservation Service Award



▲ **Gary Machlis** (second from right) receives the Conservation Service Award from Secretary of the Interior Bruce Babbitt (second from left). Also present at the awards ceremony in October were Machlis's colleagues Jean McKendry, Research Scientist with the University of Idaho Cooperative Park Studies Unit and NPS Social Science Program, and Charles Hatch, Vice President for Research and Dean of the College of Natural Resources at the University of Idaho.

In October, University of Idaho Forestry Professor and NPS Visiting Chief Social Scientist Gary Machlis received the Department of the Interior Conservation Service Award, one of the Department's highest honors granted to private citizens. Machlis was recognized for his major contribution to the Department in providing extraordinary leadership as coordinator of the multiagency Cooperative Ecosystem Studies Unit (CESU) Council. Secretary of the Interior Bruce Babbitt presented the award as part of the Department of the Interior's 60th Honor Awards Convocation.

Begun in 1998, the CESU network now includes nine federal agencies and 62 universities and other partners. The citation from Secretary Babbitt reads, "The CESU concept has been called a compelling future model for advancing partnerships between government, academe, and others. Dr. Machlis' efforts have made this concept tangible, powerful, and effective."

Gary takes pride in the honor, but quickly remarks that "this award was not just for me. It recognized hard work by many creative people—Mike Soukup, Jean McKendry, Mark Shaefer, the CESU Council, and the agency and university individuals that have turned the CESU concept into a powerful tool for 21st-century resource management and science." He said, "Receiving it at the awards ceremony reminded me that the 'joys of construction'—building something useful—are some of the best benefits of public service."

